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Book Review

Debris Flow: *Mechanics, Prediction and Countermeasures* by Tamotsu Takahashi, Taylor & Francis, 2007; ISBN 978-0-415-43552-9, (hardback) USD 119.95

The perspective taken on debris flows is primarily through investigations of the author and his coworkers but is not entirely exclusive in acknowledging other work and the author often places his work in the context of other authors. Within this perspective, the author addresses initiation, develops models for various types of developed flows, discusses their features and their deposition, and concludes with the reproduction of specific events and a discussion of countermeasures. There is a general emphasis on finding and providing quantitative models aimed at capturing key relationships mostly in comparison with lab-scale experiments (e.g., velocity-depth profiles, or debris flow deposition depth downstream of a natural dam failure). The author makes available in this text extensive work that has been published in Japanese in Disaster Prevention Research Institute (DPRI) agency reports and Japanese publications (the book itself was originally published in Japanese in 2004), as well as work more obscurely published in Proceedings. The text itself is well written and translated: Problems are posed in the beginning and followed up within subsequent chapters, and good qualitative descriptions accompany the quantitative analysis.

At the outset, the author classifies debris flows from immature flow to rigid movement based on particle concentration, and between these regimes classifies the behavior as viscous or inertial. Within these classifications, the author discusses and develops one- and two-phase continuum models to explain the developed flow and discusses means for describing flows between limit-varieties. There is also a significant discussion regarding dry granular flows. Taking a step back, the author discusses the initiation of debris flows by surface flow inducing failure of underlying sediment, as well as initiation by landslides, with a focus on the style of flow taken by the landslides mass after failure inspired by field observation. A step forward, looking at depositional processes, emphasis is placed on the debris flow fan.

The majority of references to field cases derives from the latter two chapters detailing several specific events and preventative strategies. A few cases are picked from Japan and globally with the aim of duplicating hydrographs and deposition over time, relying on numerical calculations using models developed in previous chapters. One of the strong points of the book is its presentation of debris flow countermeasures, which calls on

extensive field and lab experience with methods such as open (grilled) and closed sabo dams, and flow channels.

The text is recommended for those commencing or deeply involved in research focussing on aspects of debris flows, as well as those whose research interests may include debris flows. While much of the text delves into specific questions, parts of the text (such as the excellent overview provided by the introductory chapter) could supplement graduate level courses.

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